

**MECHANISM OF ACTION:**

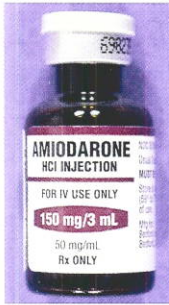
Slows the conduction of electrical impulses at the AV node.

**INDICATIONS:**

- Stable reentry SVT
- Does not convert AF, atrial flutter, or VT

**ADVERSE REACTIONS:**

- Common adverse reactions are generally mild and short-lived.
- Sense of impending doom
- Complaints of flushing
- Chest pressure
- Throat tightness
- Numbness
- May be a brief episode of asystole after administration



**MECHANISM OF ACTION:**

Acts directly on the myocardium to delay repolarization and increase the duration of the action potential.

**INDICATIONS:**

- Ventricular arrhythmias
- Second-line agent for atrial arrhythmias

**ADVERSE REACTIONS:**

- Burning at the IV site
- Hypotension
- Bradycardia

**CONTRAINDICATIONS:**

- Sick sinus syndrome
- Second- and third-degree heart block
- Cardiogenic shock
- When episodes of bradycardia have caused syncope
- Sensitivity to benzyl alcohol and iodine

**MECHANISM OF ACTION:**

This prevents the formation of a chemical known as thromboxane  $A_2$ , which causes platelets to clump together, or aggregate, and form plugs that cause obstruction or constriction of small coronary arteries.

**INDICATIONS:**

- Fever
- Inflammation
- Angina
- Acute MI
- Patients complaining of pain, pressure, squeezing, or crushing in the chest that may be cardiac in origin

**ADVERSE REACTIONS:**

- Anaphylaxis
- Angioedema
- Bronchospasm
- Bleeding
- Stomach irritation
- Nausea/vomiting

**MECHANISM OF ACTION:**

Competes reversibly with acetylcholine at the site of the muscarinic receptor:

**INDICATIONS:**

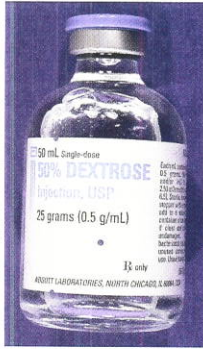
- Symptomatic bradycardia, asystole or PEA
- Nerve agent exposure
- Organophosphate poisoning

**ADVERSE REACTIONS:**

- Dry mouth, hot skin temperature, intense facial flushing
- Blurred vision or dilation of the pupils with subsequent photophobia
- Tachycardia
- Restlessness
- Atropine may cause paradoxical bradycardia if the dose administered is too low, or if the drug is administered too slowly.

**CONTRAINDICATIONS:**

- Acute MI
- Myasthenia gravis
- GI obstruction
- Closed-angle glaucoma
- Known sensitivity to atropine, belladonna alkaloids, or sulfites



**MECHANISM OF ACTION:**

Increases blood glucose concentrations.

**INDICATIONS:**

- Hypoglycemia

**ADVERSE REACTIONS:**

- Hyperglycemia
- Warmth, burning from IV infusion
- Concentrated solutions may cause pain and thrombosis of the peripheral veins.

**CONTRAINDICATIONS:**

- Intracranial and intraspinal hemorrhage
- Delirium tremens
- Solution is not clear
- Seals are not intact

**MECHANISM OF ACTION:**

Binds to the benzodiazepine receptor and enhances the effects of GABA. Benzodiazepines act at the level of the limbic, thalamic, and hypothalamic regions of the CNS and can produce any level of CNS depression required (including sedation, skeletal muscle relaxation, and anticonvulsant activity).

**INDICATIONS:**

- Anxiety
- Skeletal muscle relaxation
- Alcohol withdrawal
- Seizures

**ADVERSE REACTIONS:**

- Respiratory depression
- Drowsiness
- Fatigue
- Headache
- Pain at the injection site
- Confusion
- Nausea
- Hypotension
- Oversedation

**CONTRAINDICATIONS:**

- Children younger than 6 months
- Acute-angle glaucoma
- CNS depression
- Alcohol intoxication
- Known sensitivity

**MECHANISM OF ACTION:**

Stimulates alpha and beta adrenergic receptors. At moderate doses (2-10 mcg/kg/min), dopamine stimulates beta<sub>1</sub> receptors, resulting in inotropy and increased cardiac output while maintaining dopaminergic-induced vasodilatory effects. At high doses (>10 mcg/kg/min), alpha adrenergic agonism predominates, and increased peripheral vascular resistance and vasoconstriction result.

**INDICATIONS:**

- Hypotension and decreased cardiac output associated with cardiogenic shock and septic shock
- Hypotension after return of spontaneous circulation following cardiac arrest
- Symptomatic bradycardia unresponsive to atropine

**MECHANISM OF ACTION:**

Increased bp, hr, and bronchodilates by binding with both alpha and beta receptors.

**INDICATIONS:**

- Bronchospasm
- Allergic and anaphylactic reactions
- Cardiac arrest

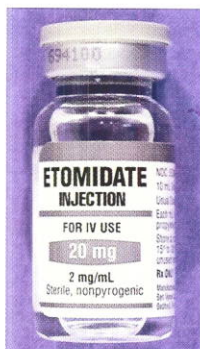
**ADVERSE REACTIONS:**

- Anxiety, nervousness, tremors
- Chest pain, cardiac arrhythmias
- Hypertension
- Nausea/vomiting, headache

**CONTRAINDICATIONS:**

- Arrhythmias other than VF, asystole, PEA
- Cardiovascular disease
- Hypertension
- Cerebrovascular disease
- Shock secondary to causes other than anaphylactic shock



**MECHANISM OF ACTION:**

Although the exact mechanism is unknown, etomidate appears to have GABA-like effects.

**INDICATIONS:**

- Induction for rapid sequence intubation and pharmacologic-assisted intubation
- Induction of anesthesia

**ADVERSE REACTIONS:**

- Hypotension
- Respiratory depression
- Pain at the site of injection
- Temporary involuntary muscle movements
- Frequent nausea/vomiting on emergence
- Adrenal insufficiency
- Hyperventilation
- Hypoventilation
- Apnea of short duration
- Hiccups

**MECHANISM OF ACTION:**

Binds to opiate receptors, producing analgesia and euphoria.

**INDICATIONS:**

- Pain

**ADVERSE REACTIONS:**

- Respiratory depression
- Apnea
- Hypotension
- Nausea/vomiting
- Dizziness
- Sedation
- Euphoria
- Sinus bradycardia
- Sinus tachycardia
- Palpitations
- Hypertension
- Diaphoresis
- Syncope
- Pain at injection site

**MECHANISM OF ACTION:**

Competes with benzodiazepines for binding at the benzodiazepine receptor; reverses the sedative effects of benzodiazepines.

**INDICATIONS:**

- Benzodiazepine oversedation

**ADVERSE REACTIONS:**

- Resedation
- Seizures
- Dizziness
- Pain at injection site
- Nausea/vomiting
- Diaphoresis
- Headache
- Visual impairment

**MECHANISM OF ACTION:**

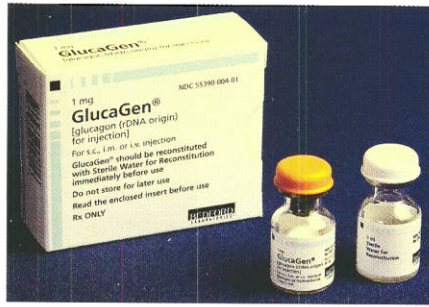
Inhibits the absorption of the sodium and chloride ions and water in the loop of Henle, as well as the convoluted tubule of the nephron. This results in decreased absorption of water and increased production of urine.

**INDICATIONS:**

- Pulmonary edema
- CHF
- Hypertensive emergency

**ADVERSE REACTIONS:**

- Vertigo
- Dizziness
- Weakness
- Orthostatic hypotension
- Hypokalemia
- Thrombophlebitis
- Patients with anuria, severe renal failure, untreated hepatic coma, increasing azotemia, and electrolyte depletion can develop life-threatening consequences.

**MECHANISM OF ACTION:**

Converts glycogen to glucose.

**INDICATIONS:**

- Hypoglycemia
- Beta blocker overdose

**ADVERSE REACTIONS:**

- Nausea/vomiting
- Rebound hyperglycemia
- Hypotension
- Sinus tachycardia

**MECHANISM OF ACTION:**

The hyperonic nature of this fluid pulls extravascular fluid into the vascular space. Hypertonic saline may therefore be used as a volume expander in cases of hypovolemia or to reduce the edema of the swollen brain. Three percent saline has an electrolyte concentration of 514 mEq/L sodium.

**INDICATIONS:**

- Reduction of increased intracranial pressure resulting from traumatic brain injury
- Hypovolemic shock

**ADVERSE REACTIONS:**

- Increased rate of bleeding
- Alteration of blood clotting ability
- Osmotic demyelination syndrome

**MECHANISM OF ACTION:**

Produces a state of anesthesia while maintaining airway reflexes, heart rate, and blood pressure.

**INDICATIONS:**

- Pain and as anesthesia for procedures of short duration

**ADVERSE REACTIONS:**

- Emergence phenomena
- Hypertension and sinus tachycardia
- Hypotension and sinus bradycardia
- Other cardiac arrhythmias (rare)
- Respiratory depression
- Apnea
- Laryngospasms and other forms of airway obstruction (rare)
- Tonic and clonic movements
- Vomiting

**MECHANISM OF ACTION:**

Blocks sodium channels, increasing the recovery period after repolarization; suppresses automaticity in the His-Purkinje system and depolarization in the ventricles.

**INDICATIONS:**

- Ventricular arrhythmias, when amiodarone is not available
- Cardiac arrest from VF/VT
- Stable monomorphic VT with preserved ventricular function

- Stable polymorphic VT with normal baseline QT interval and preserved left ventricular function (when ischemia and electrolyte imbalance are treated)
- Stable polymorphic VT with baseline QT-prolongation suggestive of torsades de pointes

**ADVERSE REACTIONS:**

- Toxicity (signs may include anxiety, apprehension, euphoria, nervousness, disorientation, dizziness, blurred vision, facial paresthesias, tremors, hearing disturbances, slurred speech, seizures, sinus bradycardia)
- Seizures without warning
- Cardiac arrhythmias
- Hypotension
- Cardiac arrest
- Pain at injection site



**MECHANISM OF ACTION:**

Binds to the benzodiazepine receptor and enhances the effects of the brain chemical GABA, an inhibitory transmitter; and may result in a state of sedation, hypnosis, skeletal muscle relaxation, anticonvulsant activity, coma.

**INDICATIONS:**

- Preprocedure sedation induction
- Anxiety
- Status epilepticus

**ADVERSE REACTIONS:**

- Headache
- Drowsiness, dizziness, vertigo
- Ataxia
- Amnesia
- Depression, euphoria, fatigue
- Dysarthria
- Syncope
- Tremor
- Respiratory depression
- Paradoxical CNS stimulation

**MECHANISM OF ACTION:**

This is required for normal physiologic functioning. Magnesium is a cofactor in neurochemical transmission and muscular excitability. Magnesium sulfate controls seizures by blocking peripheral neuromuscular transmission. Magnesium is also a peripheral vasodilator and an inhibitor of platelet function.

**INDICATIONS:**

- Torsades de pointes
- Cardiac arrhythmias associated with hypomagnesemia
- Eclampsia and seizure prophylaxis in preeclampsia
- Status asthmaticus

**ADVERSE REACTIONS:**

- Magnesium toxicity (signs include flushing, diaphoresis, hypotension, muscle paralysis, weakness, hypothermia, and cardiac, CNS, or respiratory depression)

**CONTRAINDICATIONS:**

- AV heart block
- GI obstruction
- Use with caution in renal impairment

**MECHANISM OF ACTION:**

Facilitates the flow of fluid out of tissues (including the brain) and into interstitial fluid and blood, thereby dehydrating the brain and reducing swelling. Reabsorption by the kidney is minimal, consequently increasing urine output.

**INDICATIONS:**

- Increased ICP

**ADVERSE REACTIONS:**

- Pulmonary edema
- Headache
- Blurred vision
- Dizziness
- Seizures
- Hypovolemia
- Nausea/vomiting

**MECHANISM OF ACTION:**

Binds to the benzodiazepine receptor and enhances the effects of GABA. Produces short-acting CNS depression (including sedation, skeletal muscle relaxation, and anticonvulsant activity).

**INDICATIONS:**

- Sedation
- Anxiety
- Skeletal muscle relaxation

**ADVERSE REACTIONS:**

- Respiratory depression/arrest
- Hypotension
- Nausea/vomiting
- Headache
- Hiccups
- Cardiac arrest

**CONTRAINDICATIONS:**

- Acute-angle glaucoma
- Pregnant women
- Known sensitivity

**MECHANISM OF ACTION:**

Binds with opioid receptors. Morphine is capable of inducing hypotension by depression of the vasomotor centers of the brain, as well as release of the chemical histamine. In the management of angina, morphine reduces stimulation of the sympathetic nervous system caused by pain and anxiety. Reduction of sympathetic stimulation reduces heart rate, cardiac work, and myocardial oxygen consumption.

**INDICATIONS:**

- Moderate to severe pain, including chest pain associated with ACS, CHF, pulmonary edema

**ADVERSE REACTIONS:**

- Respiratory depression
- Hypotension
- Nausea/vomiting
- Dizziness
- Lightheadedness
- Sedation
- Diaphoresis
- Euphoria
- Dysphoria
- Worsening of bradycardia and heart block in some patients with acute inferior wall MI, seizures, cardiac arrest, anaphylactoid reactions

**MECHANISM OF ACTION:**

Binds to the opioid receptor and blocks the effect of narcotics.

**INDICATIONS:**

- Narcotic overdoses
- Reversal of narcotics used for procedure-related anesthesia

**ADVERSE REACTIONS:**

- Nausea/vomiting
- Restlessness
- Diaphoresis
- Tachycardia
- Hypertension
- Tremulousness
- Seizures
- Cardiac arrest
- Narcotic withdrawal
- Patients who have gone from a state of somnolence from a narcotic overdose to wide awake may become combative.



**MECHANISM OF ACTION:**

Relaxes vascular smooth muscle, thereby dilating peripheral arteries and veins.

**INDICATIONS:**

- Angina
- Hypertension
- Myocardial ischemia associated with cocaine intoxication

**ADVERSE REACTIONS:**

- Headache
- Hypotension
- Bradycardia
- Lightheadedness
- Flushing
- Cardiovascular collapse

**MECHANISM OF ACTION:**

Norepinephrine is an  $\alpha_1$ ,  $\alpha_2$ , and  $\beta_1$  agonist. Alpha-mediated peripheral vasoconstriction is the predominant clinical result of administration, resulting in increasing blood pressure and coronary blood flow. Beta adrenergic action produces inotropic stimulation of the heart and dilates the coronary arteries.

**INDICATIONS:**

- Cardiogenic shock
- Septic shock
- Severe hypotension



**MECHANISM OF ACTION:**

Facilitates cellular energy metabolism.

**INDICATIONS:**

- Hypoxia
- Ischemic chest pain
- Respiratory distress
- Suspected carbon monoxide poisoning
- Traumatic injuries
- Shock

**ADVERSE REACTIONS:**

- High concentrations can cause decreased level of consciousness and respiratory depression in patients with chronic carbon dioxide retention or chronic lung disease.

**MECHANISM OF ACTION:**

Antagonizes acetylcholine at the motor end plate, producing skeletal muscle paralysis.

**INDICATIONS:**

- To induce neuromuscular blockade for the facilitation of ET intubation

**ADVERSE REACTIONS:**

- Muscle paralysis
- Apnea
- Dyspnea
- Respiratory depression
- Cutaneous flushing
- Sinus tachycardia

**MECHANISM OF ACTION:**

Stimulates the alpha receptors, causing vasoconstriction, which results in increased blood pressure.

**INDICATIONS:**

- Neurogenic shock
- Spinal shock
- Cases of shock in which the patient's heart rate does not need to be increased
- Drug-induced hypotension

**ADVERSE REACTIONS:**

- Hypertension
- VT
- Headache
- Excitability
- Tremor
- MI
- Exacerbation of asthma
- Cardiac arrhythmias
- Reflex bradycardia
- Soft tissue necrosis

**MECHANISM OF ACTION:**

Replaces potassium. Slight alterations in extracellular potassium levels can cause serious alterations in both cardiac and nervous function.

**INDICATIONS:**

- Hypokalemia

**ADVERSE REACTIONS:**

- Hyperkalemia
- AV block
- Cardiac arrest
- GI bleeding, obstruction, perforation
- Tissue necrosis if the infusion infiltrates into the soft tissues



## MECHANISM OF ACTION:

Produces a rapid and brief state of general anesthesia.

## INDICATIONS:

- Anesthesia induction

## ADVERSE REACTIONS:

- Apnea
- Cardiac arrhythmias
- Asystole
- Hypotension
- Hypertension
- Pain at injection site

## CONTRAINDICATIONS:

- Hypovolemia
- Known sensitivity (including soybean oil, eggs)

## DOSAGE:

A general induction dose used to produce a state of unconsciousness rapidly is 1.5 to 3.0 mg/kg IV, IO.